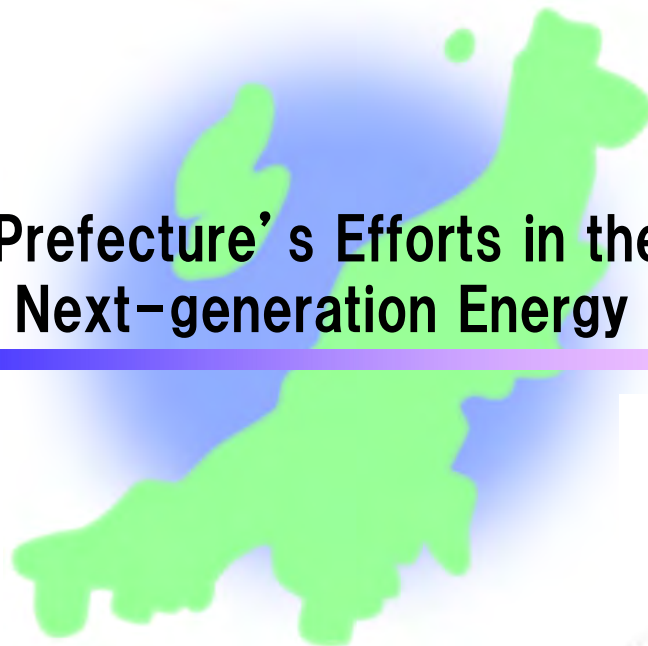


# Niigata Prefecture's Efforts in the Renewable and Next-generation Energy Sector



January 30, 2019

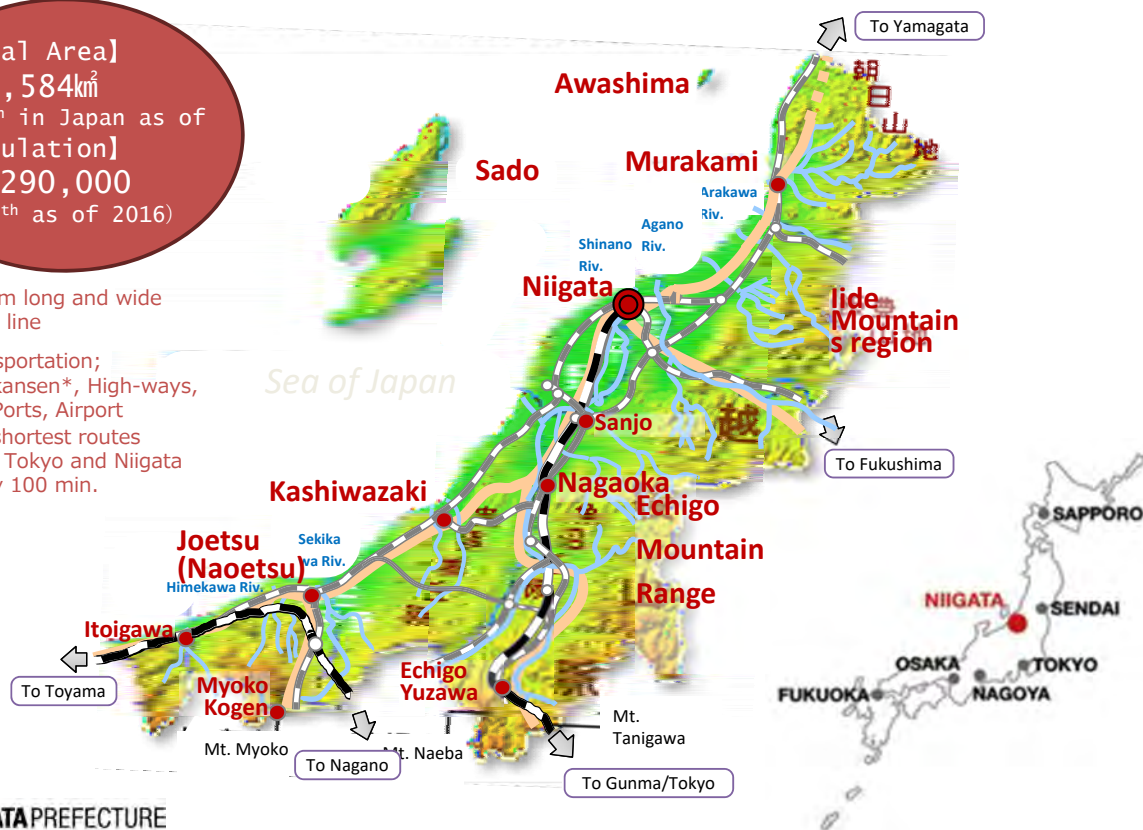
Niigata Prefectural Government

Department of Industry, Labor and Tourism Industry Promotion

## About Niigata Prefecture

**[Total Area]**  
12,584km<sup>2</sup>  
(5<sup>th</sup> in Japan as of 2016)  
**[Population]**  
2,290,000  
(15<sup>th</sup> as of 2016)

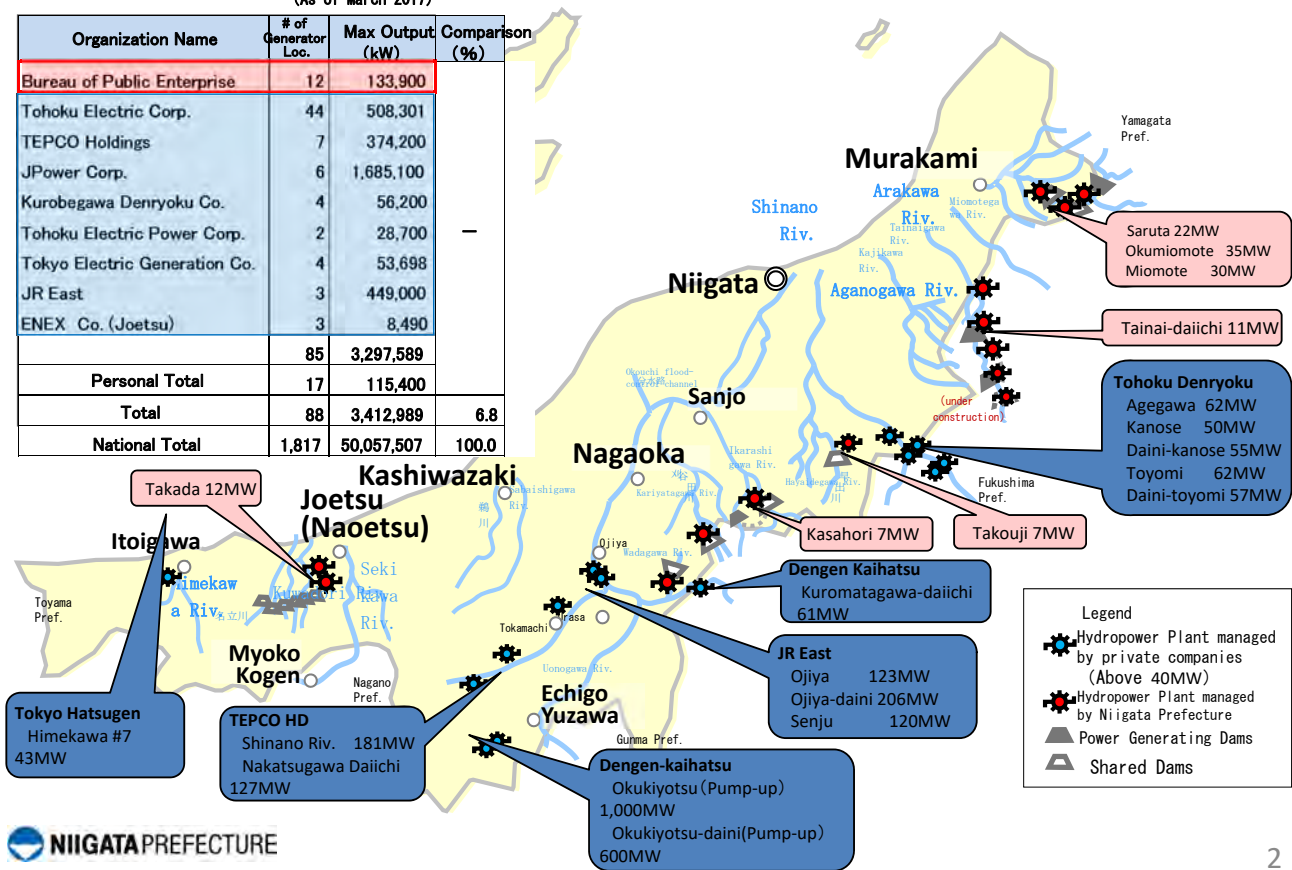
- ✓ 331km long and wide coast line
  - ✓ Transportation; Shinkansen\*, High-ways, Sea Ports, Airport
- \*The shortest routes between Tokyo and Niigata take only 100 min.



# Our Hydropower Generation

(As of March 2017)

Organization Name	# of Generator Loc.	Max Output (kW)	Comparison (%)
Bureau of Public Enterprise	12	133,900	
Tohoku Electric Corp.	44	508,301	
TEPCO Holdings	7	374,200	
JPower Corp.	6	1,685,100	
Kurobegawa Denryoku Co.	4	56,200	
Tohoku Electric Power Corp.	2	28,700	
Tokyo Electric Generation Co.	4	53,698	
JR East	3	449,000	
ENEX Co. (Joetsu)	3	8,490	
	85	3,297,589	
Personal Total	17	115,400	
Total	88	3,412,989	6.8
National Total	1,817	50,057,507	100.0



NIIGATA PREFECTURE

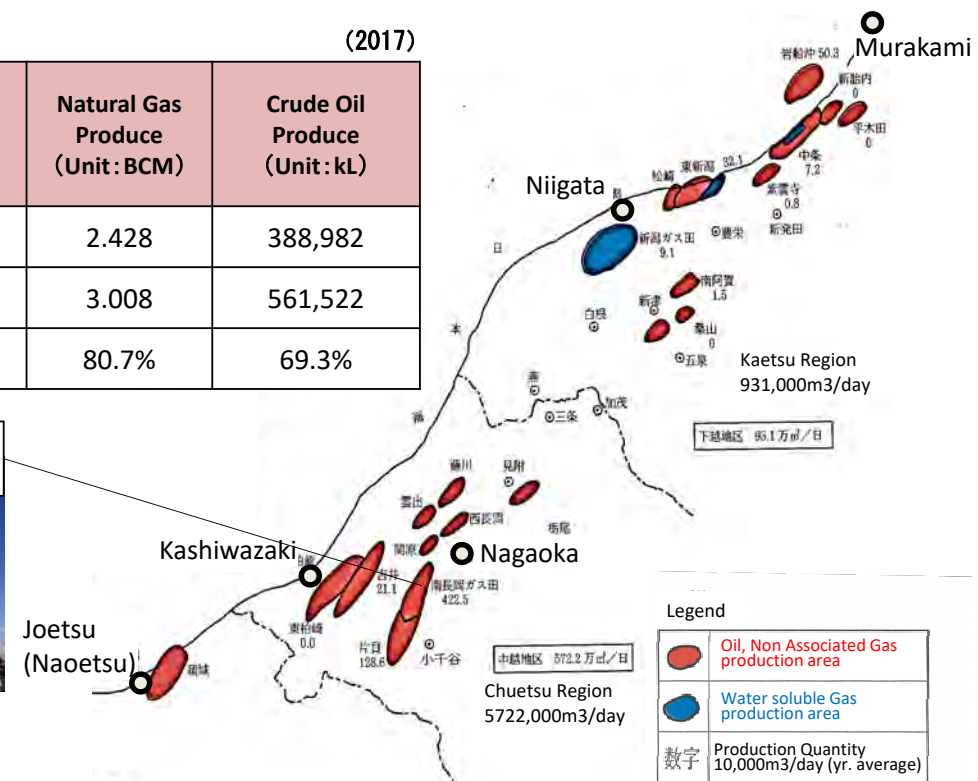
# Niigata Oil/Natural Gas Production

(2017)

	Natural Gas Produce (Unit: BCM)	Crude Oil Produce (Unit: kL)
Niigata	2.428	388,982
National	3.008	561,522
Niigata/National	80.7%	69.3%

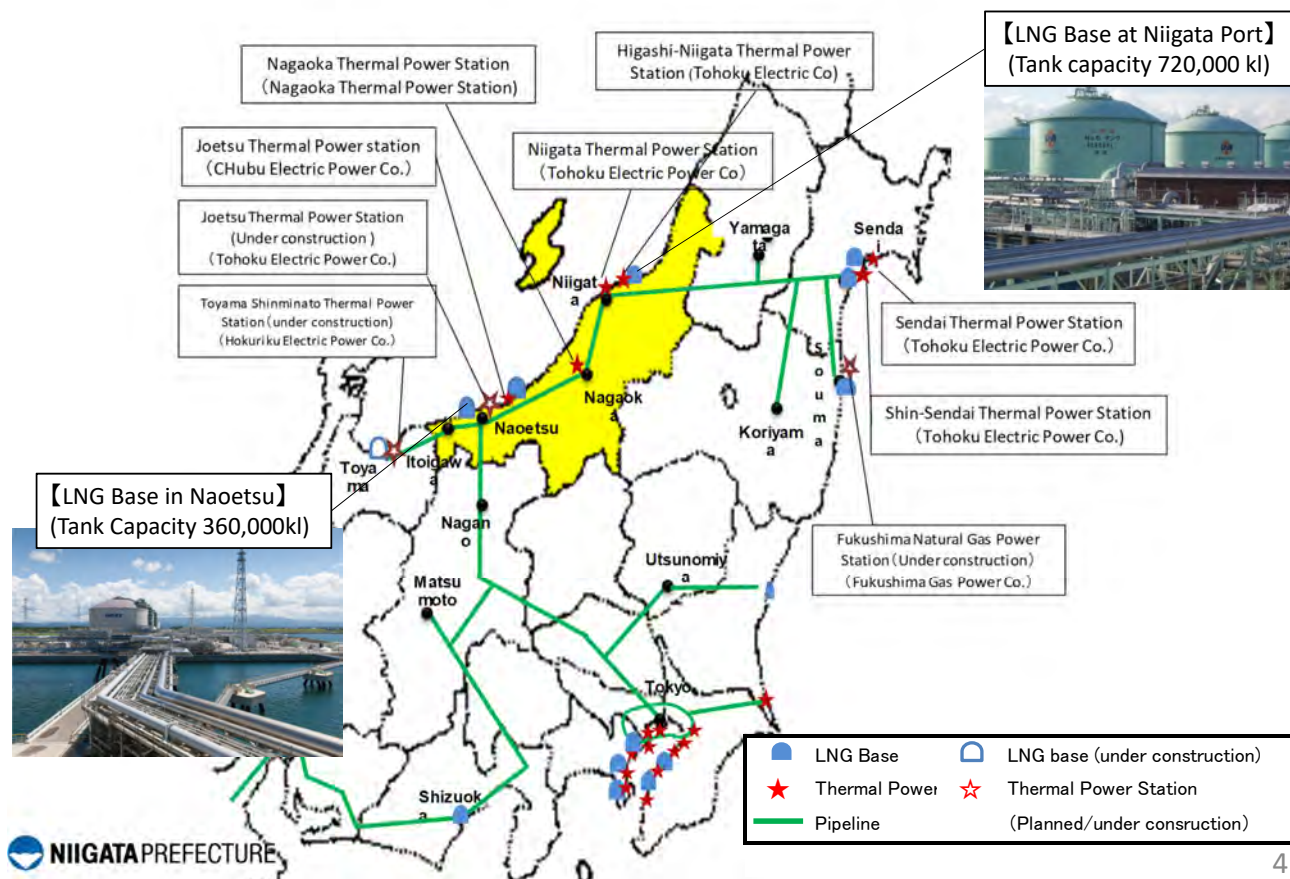


【Minami-Nagaoka Gas field】



NIIGATA PREFECTURE

# LNG Terminals and Gas Pipelines

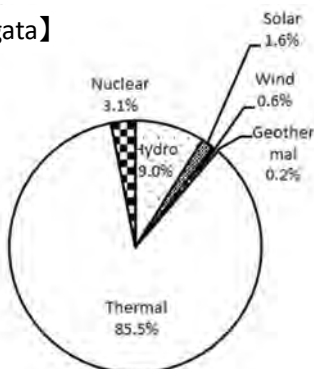


4

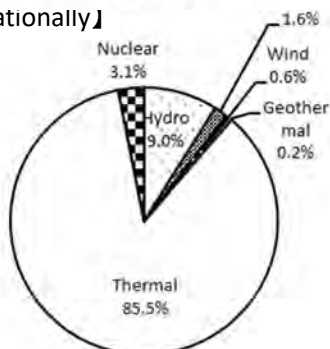
# Status of Niigata's Electric Power

● Power Source Composition (FY2017)

[Niigata]



[Nationally]



● Power generation volume in Niigata (for FY2017)

[GWh]

Total	(Renewable energy)			Thermal	Nuclear
	Hydro	Solar	Wind		
49,205 (100%)	8,002 (16.3%)	110 (0.2%)	45 (0.1%)	41,048 (83.4%)	0 (0.0%)

● Power generation and consumption (for FY2017)

[GWh]

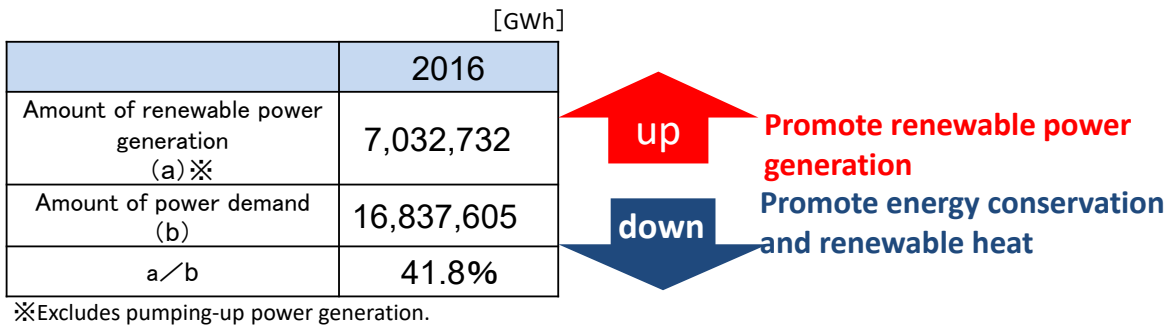
	Power Generation	Power Consumption
Niigata	49,205	17,233
National	1,007,423	863,137
Niigata/National	4.9%	2.0%

⇒ More than 50% of the power generated in Niigata is used outside of Niigata Prefecture.

## Goals for the “Create Niigata’s Future” Plan

- Set up a ratio index to indicate how much of Niigata’s yearly power demand can be covered for with renewable energy.
- We aim to achieve this goal to increase the ratio numerator (i.e. the amount of renewable power generation) through the promotion of renewable power generation, while decreasing the denominator (i.e. the power demand in Niigata Pref.) through the promotion of energy conservation and use of renewable heat.

Index Name	Current Status	Interim Goal (FY2020)	Final Goal (FY2024)
Ratio of the quantity of renewable power generation, over the amount of power demand in Niigata.	41.8% (FY2015)	46%	52%



## Promotion of the Application of Renewable/Next-Generation Energy

- Niigata aims to expand the options in energy for the future, and to encourage local companies to start up in related industries. We will realize this through the promotion of renewable energy, which puts to use diverse regional resources, as well as by supporting local companies to enter the renewable and next-generation energy sector.

	Characteristics (strengths) of Niigata Pref. resources	Action taken up to now	Future challenges	Developmental Direction as of 2018
Renewable energy—Electricity	Solar energy	Able to produce the same volume of energy as the Pacific coast side	○ Prefecture-owned and operated Mega-solar plant ○ Privately owned Mega-solar site on public, prefecture-owned land ○ Promotion for the implementation of solar power for household use ○ Research on electricity stabilization measurements (EV reusable batteries)	<b>Promotion for wind power generation</b> Utilizing the prefecture’s potential ● Hold wind power generation research meetings (¥500,000 • same amount as 2017) ● Support to enter large windmill maintenance business (¥7million • New project)
	Wind and Ocean energy	• Long coast line (suitable for ocean current and off-shore wind power generation)	○ Development and testing current ocean power generation system ○ Awashima Island was chosen as the nation’s testing field ○ Testing of potential ocean current and off-shore power generation ○ Held forum about wind power generation, including off-shore wind power	
	Geothermal power	• Nation’s 3 <sup>rd</sup> largest number of hot springs	Investigation for potential geothermal power • Testing Binary geothermal power generation (Matsunoyama Hot springs)	<b>Promote associated industries in the prefecture through renewable and next generation energy</b> ● H Station, Formulate plan for diffusion of FCV (¥77.246 million; ¥8.5 million in 2017) ● Hold Hydrogen promotion committee meeting (¥500,000; new project) ● Promotion to develop Methane hydrates resources (¥4 million; ¥5 million in 2017) ● Support for R&D to enter new energy industries (¥3.03 million; same amount in 2017)
	Hydropower, Micro hydro power	• Nation’s 4 <sup>th</sup> largest volume of hydraulic resources	○ Testing of potential micro hydro power ○ Prefecture-owned and operated hydro power generation (to secure and return the profit from selling electricity)	
Renewable energy—thermal	Snow Energy (Data center)	• Heavy snowfall with easy access from the Greater Tokyo area (well located)	○ Data Center’s survey for adequacy of snowy regions ○ Land promotion project (Tsunan Town), Testing the effectiveness of snow energy	<b>Promote related industry (for future prospects)</b>
	Geothermal heat	• Collection of related organizations (products, excavation)	○ Support for the education of related organizations to further diffusion of info. ○ Promote for the implementation of geothermal heat systems.	
Next-generation energy	Methane hydrate	• Approx. 0.6 Bcm exist on one Joetsu site	○ Establishment of the Niigata Research Committee for shallow Methane Hydrate ○ Development & Promotion by Japan Sea Union, consisting of 12 prefectures	
	Hydrogen	Numerous hydrogen supply bases	○ FCV • Established the Hydrogen Station Promotion Vision	

# Potential of Off-shore wind power in Niigata Prefecture

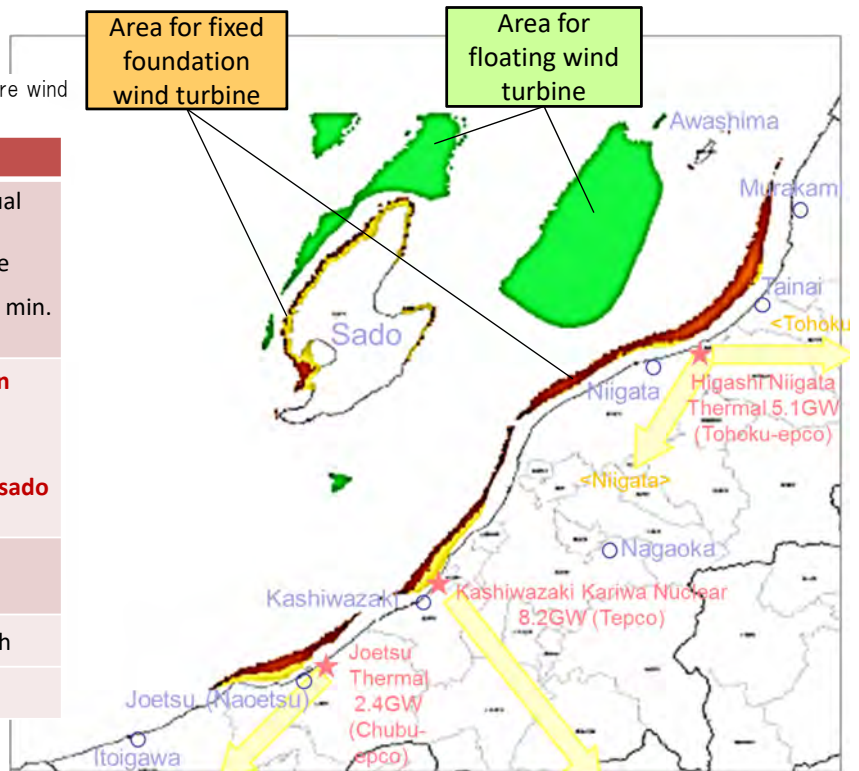
- The prefectural government conducted survey of wind power potential in FY2016.
- Created “Potential Map” which identifies wind speed and restrictions. (land as well as off-shore area)

**<Results of Survey (Summary) >**

Sea areas which show potential for off-shore wind power, and the potential power generation.

	Fixed	Floating
Guide	<ul style="list-style-type: none"> <li>• Average annual wind speed: 6.5m/s or more</li> <li>• Water depth: 50m or less</li> </ul>	<ul style="list-style-type: none"> <li>• Average annual wind speed: 8.0m/s or more</li> <li>• Water depth: min. 50m to 200m</li> </ul>
Sea Areas	<ul style="list-style-type: none"> <li>• Coastal areas in Joetsu, Chuetsu and Kaetsu regions</li> <li>• Coastal area on Oosado</li> </ul>	<ul style="list-style-type: none"> <li>• Area between Sado and Awashima</li> <li>• Off-shore Oosado region</li> </ul>
Area	615km <sup>2</sup>	1,379km <sup>2</sup>
Power	16,612GWh	52,261GWh
	<b>68,873GWh</b>	

※This does not take into account fishermen rights and other restrictions.  
 ※Energy production volume is estimated based on annual power generation by large windmills (8MW)



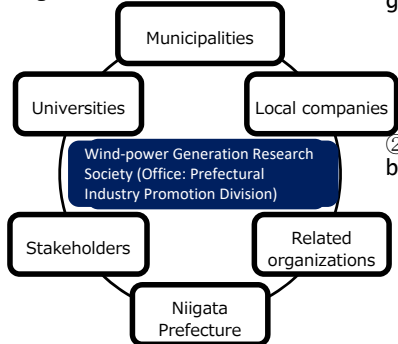
<http://www.pref.niigata.lg.jp/sangyoshinko/1356865431914.html>

## Promotion to Implement Wind Power

- Since implementing large-scale wind power generation (especially off-shore wind), which brings a huge economic benefit once established, requires many conditions, Niigata Prefecture is preparing to improve business environment (e.g. coordinating with stakeholders) and promotes related industries.

**[1] Study & review to take in wind power generation businesses and to promote related industries.**

(Budget: ¥0.5million)



**① Preparations for taking in wind power generation businesses**

Study to increase receptivity for off-shore wind power.

Draft of potential sea locations

Discuss (increase receptivity)

Decide sea locations to be used

- Increased receptivity
- Smooth link up with national public offering schemes
- Attract entrepreneurs, smooth power generation business operations

**② Considering support for the construction sector of businesses such as parts for wind turbines.**

Research for starting up businesses for the production/construction sector for wind power.

Learn the structure of wind power

Discuss

Ascertain fields to start up

- Consider supports such as matching with turbine makers, etc. in fields with high potential.

※Additionally, take steps to solve the issue of grid connection, which is being actual barrier in the prefecture.

**[2] Support for local Niigata businesses to start up in the large wind turbine maintenance field (skill development)**

(Budget: ¥7million)

**Subsidy for businesses starting wind power generation maintenance**

- Assistance to obtain the skills for large wind turbine maintenance.
- Ex: Lecture fee for the Hitachi Wind Power Maintenance Training Center
- Aid amount: 50% (Max. ¥700,000)

Plan for introduction of maintenance work

Lectures at training facility

Obtain maintenance skills

- Local Niigata business start up/introduction
- Full use of the prefecture's O&M system (Contribute to stabilization maintenance of wind turbines)

Small/micro wind power has many outlets for power generation, and comparatively less location restrictions. We will also promote businesses starting in this field through direct financial support as shown on the right, for the development of marketable products and establishments for domestic consumption.

Promotion of businesses to start establish renewable energy facilities (Budget: ¥25.3million) [detailed separately]

Promotional activities for skill development and promoting businesses starting in the field of new energy (Budget: ¥30.3million) [detailed separately]

# Domestic-Consumption & Renewable Energy Implementation Promotion

## Promotion Project to implement facilities for renewable energy

**Project Outline**      **Budget: ¥ 25.3 million**

- Support businesses that do start ups in renewable energy for the purpose of domestic consumption, energy storage, and other establishments regardless of the Feed-in Tariff (FIT) system.

[Conditions for Aid]  
 ○ Aid covers 1/3 or less (max. ¥5 million)  
 ○ Eligible parties: Groups and corporations (etc.) with operating facilities within the prefecture.  
 ○ Eligible facilities: Power generation/power storage facilities (etc.) that make use of renewable energy for the purpose of self-consumption which operation facilities within the prefecture.

The diagram illustrates the process: 'After guidance' leads to 'aid 補助' (aid support) for '自家消費' (self-consumption). Renewable energy sources like solar, wind, and geothermal are used to power an 'Energy Storage facility', which then supplies power to 'office' and 'factory' buildings.

## Promotion Project to implement regional participation in renewable energy

**Project Outline**      **Budget: ¥ 8.55 million**

- Aiming to construct an energy system\* for the purpose of regional production/consumption that makes use of the region's characteristics, we will provide support for plans that aim to start establishing renewable energy facilities at the regional level.

[Conditions for Aid]  
 ○ Aid covers 50% or less (max. ¥5 million)  
 ○ Eligible parties: Private groups/orgs., etc.

\*Manages the versatility of electric and thermal power (etc.) in the most appropriate way, on a regional level.

The diagram shows 'Prefecture 県' and 'municipalities 市町村' collaborating ('協力 cooperation') with 'Private groups 民間団体等'. They work on a 'Plan [Ex. Of steps]' including 'Holding meetings', 'Consideration of energy management', and 'Consideration for plan to regulate for business'. The plan involves 'Aid for activities in small-scale regional applied use of renewable energy' and 'Investigate implementations'. An example shows 'Company A' and 'Company B' managing power generation and storage in an industrial park.

## Support project to implement household use of geothermal heat.

**Project Outline**      **Budget: ¥ 10.5 million**

- For household AC/Heaters, snow melting machines, and boilers that use geothermal energy, we would aid with a portion of preliminary implementation costs, such as installation and construction fees.

The diagram shows a geothermal system with an '掘削機 excavator' (excavator) for drilling, a 'Heat exchanger 熱交換器', and a 'Heat pump' connected to a 'Thermal energy heat exchanger' for household use.

[Conditions for Aid]  
 ○ Aid covers 1/3 or less (max. ¥500,000)  
 ○ Construction and part orders to businesses within Niigata Prefecture must account for 50% or more of implementation costs.  
 ○ To monitor progress, recipients are to submit reports of their impressions and a comparison of light and heating expenses from 1 year before to 1 year after installation/implementation.

10

# Industry Promotion Through Next-Generation Energy

## Hydrogen Fuel / Energy

**Goal・Aim**

- To plan for the expansion of hydrogen fuel use, and take steps towards the dissemination of the establishment of fuel-cell vehicles (FCV) and Hydrogen Stations (ST).
- To clarify the significance of disseminating FCVs and using hydrogen fuel in the "Niigata Prefecture FCV/Hydrogen Station Dissemination" plan formulated in the 2017 fiscal year.
- To support the establishment of hydrogen station and increased awareness for residents of Niigata in the 2018 fiscal year according to the visionary plan above.

**Description of this fiscal year's enterprises**

- **Assistance for Hydrogen ST establishment ( ¥ 75 million)**  
25% of operation costs for 1 location established and based in Niigata City, max. ¥ 75 million.
- **Location selection for the Hydrogen ST/hold grand opening ( ¥ 1,814,000)**  
Plan to increase awareness and popularize the above by holding a grand opening event.
- **Preliminary implementation of FCVs( ¥ 432,000)**  
Prefectural government will lease FCVs as part of initial implementations to work for awareness/dissemination.
- **Hold a conference for the Hydrogen Energy Dissemination Research Society ( ¥ 500,000)**  
Conduct surveys and research for the use and application of hydrogen fuel by businesses and organizations within the prefecture. (Conduct 3 times/year)

### Expected developments in enterprises

**< FY 2017 >**  
 Our Vision Plan  
 Significance and effect of Niigata Prefecture's actions towards the dissemination of FCVs and use and application of hydrogen.

- ① Decrease impact on the environment (CO<sub>2</sub>)
- ② Diversification of energy sources(energy security)
- ③ Application of renewable energy
- ④ Promotion of local industries
- ⑤ Constructing a network on the Sea of Japan coast

**< FY 2018 >**  
 Establishment of hydrogen stations, dissemination of FCVs, increased awareness for residents of Niigata

**< FY 2019 ~ >**  
 Expanded use and application of hydrogen fuel

## Shallow Methane Hydrate

(Methane Hydrate Resource Development & Promotion Project Budget: ¥4 million)

### Japan Sea Union for the Promotion of Resource Development for Marine Energy

Made up of 12 prefectures on the Sea of Japan Coast, their goal are to make use of the Sea of Japan regions' potential, and to accelerate marine energy resource development.(Est.2012)

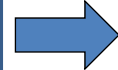
- Activities**
- Forums, discourse with the national government for the goal of promoting resource development.
  - Deliver suggestions/ activity requests to the national gov.

### Niigata Research Society for Shallow Methane Hydrate

Their goals are to collect information relation to methane hydrate, to support network creation among relevant parties, surveys and research, and to link technology and human resources in the prefecture for future resource development. Made up of local businesses, universities, and research organizations (Est.2015)

- Action by the Research Society**
- Making a reciprocal network for members, sharing related info.
  - Investigate and research the application of technologies available within the prefecture for resource development

Back up the nation's survey to figure out the amount of resources



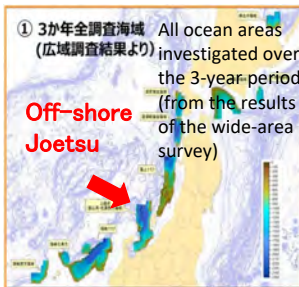
Share the situation of research on collection techniques and suggest related techniques of local firms.



### National Government

- Investigate the amount of surface-layer shallow Methane Hydrate (2013 to 2015)

- After conducting a wide area land survey, 1,742 gas chimney structures were found in which shallow methane hydrate possibly exists.
- The volume of methane hydrate in one of off-shore Joetsu site is estimated to be roughly 600m<sup>3</sup> million of methane hydrate.



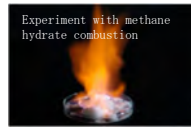
Presented by: METI Methane Hydrate Development Application Council (32nd) Info. Forms

- What the National Government is doing.

- Research and study shallow methane hydrate collection techniques
- Research for collection techniques (scheduled from 2016 to 2018)
- Investigation to prove the existence of shallow methane hydrate deposits

## Awareness and Dissemination

- Actions by the Prefecture**
- Seminar on related technologies (Targeting local businesses to increase motivation to start up related industries)
  - Informative classes (To promote the understanding of Niigata residents)



## Promotion and Development Project for New Energy Industries

Budget ¥30.8 million

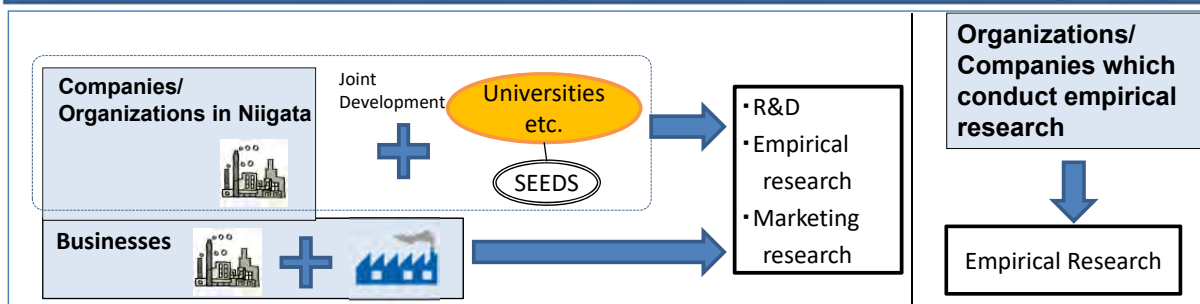
### Objective・Goals

- Encourage companies in Niigata to start up the new energy sector which is expected to grow and create new fields in the industry; to enhance economic growth in Niigata.
  - Financially assist companies in Niigata in new energy product development, and to support research and development costs so that they can present their own products to other manufacturers.
  - To support costs for marketing surveys before product development in order to promote appropriate product development to meet market needs.
  - Support pre-survey costs of investigating the environment before conducting empirical research (To help them work with companies in Niigata in the post-survey development stage.)

### Project Outline

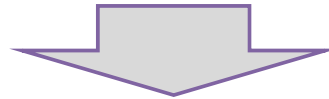
- Financial support for research and development, empirical research and surveys to encourage companies in Niigata to start and bring up a new energy industry sector.
  - [Parties to be subsidized] • Business owners/companies in Niigata which collaborate with universities, etc.
  - Several businesses, including local companies
  - Companies/organizations which conduct empirical research in Niigata.
  - [Fields to be subsidized] • Solar, wind, biomass, geothermal, marine, snow/cold, hydrogen, and hydro-power generation; other fields that meet the direction of plans from other prefectures.
  - [Costs to be subsidized] • Development costs (research and development, validation testing)
  - Research fee (e.g. marketing research, empirical environmental testing)
  - [Subsidy rate] up to 50%
  - [Maximum amount of subsidy] max. ¥5 million

### Project Image




## In Conclusion:

- **Blessed with a variety of changing natural resources**
- **Major infrastructure on the Sea of Japan coast**
- **Experienced in the use of various energy sources**



**Aiming to expand the implementation of renewable energy**



**Thank you for your time and attention.**